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| 09/866,817 | 05/30/2001 | Andrew David Silber | 106538 | 5099 |

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| EXAMINER |
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EDWARDS, PATRICK L

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| ART UNIT | PAPER NUMBER |
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2621

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/866,817

Applicant(s)

SILBER, ANDREW DAVID

Examiner

Patrick L. Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-17 and 20-27 is/are rejected.
- 7) ☐ Claim(s) 4-5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. The response received on 22 November 2004 has been placed in the file and was considered by the examiner. An action on the merits follows.

Response to Arguments

2. The applicant's arguments, filed on 22 November 2004, have been fully considered. A response to these arguments is provided below.

35 USC 112, First Paragraph Rejections

Procedural Posture:

Claims 6, 7, 20, and 21 stand rejected under 35 USC 112(1), as failing to comply with the written description requirement. Applicant has amended these claims.

Summary of Argument:

Applicant points to multiple paragraphs in the specification, and explains how these paragraphs, read together, disclose the limitations in question.

Examiner's Response:

Applicant's arguments have been fully considered. Regarding claims 6 and 7: Applicant's argument with respect to these claims is persuasive. The previous 112(1) rejection to these claims is hereby withdrawn.

Regarding claim 20: The previous 112(1) rejection is hereby withdrawn because the disclosure refers to a software routine and further refers to a memory portion. This is sufficient support for the limitation of a "recording medium that stores a control program which is executable on a computing device."

Regarding claim 21: Applicant's arguments have been fully considered but are not persuasive. Regardless of whether encoded carrier waves are disclosed in the *Training Manual* for examiners, they do not appear to be sufficiently described—either explicitly or implicitly—in the instant application.

35 USC 112, Second Paragraph Rejections

Procedural Posture:

Claims 6 and 7 stand rejected under 35 USC 112(2), as being indefinite for failing to particularly point out and distinctly claim the invention. Applicant has amended these claims.

Summary of Argument:

Applicant asserts that the setback distance represents "a distance from the edge pixels and the zone boundary."

Examiner's Response:

Applicant's arguments have been fully considered but are not persuasive. In the previous office action, claims 6 and 7 were rejected because of the indefiniteness of the term "setback distance." More specifically, the examiner requested clarification as to whether this "setback distance" was a depth value (i.e. a value in the z-axis), or a spatial

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distance (i.e. a distance in the x-y coordinate system of the image). Neither the supporting specification nor the applicant's explanation have cured this ambiguity.

Prior Art Rejections

Procedural Posture:

Claims 1-5, 8-20, and 22-27 are rejected under 35 USC 102b as being anticipated by Olsson (USPN 6,445,415). Claims 6 and 7 stand rejected under 35 USC 103a as being unpatentable over Olsson in view of Muir (USPN 6,064,767). Claim 21 stands rejected under 35 USC 103a as being unpatentable over Olsson in view of Bruce (USPN 6,678,064). Applicant has cancelled claims 18 and 19, and amended the remaining claims.

Summary of Argument:

1. Applicant argues that Olsson fails to teach, suggest, or disclose the limitation of suppressing image artifacts which correspond to out-of-focus edges or boundaries in the source images from inclusion into the composite image (applicant's remarks pg. 20).

2. Applicant further argues that the combination of Olsson and Muir fails to teach every element of claims 6 and 7, and that the combination of Olsson and Bruce fails to teach every element of claim 21 (applicant's remarks, pg. 20). Applicant also argues that there is no motivation to combine these references (applicant's remarks, pg. 21)

Examiner's Response:

1. Applicant's arguments have been fully considered but are not persuasive. Olsson discloses that the "the defocused image borders can be corrected." This anticipates the limitation in question because the border as disclosed in Olsson qualifies as the claimed "edge or boundary." The act of correcting defocused borders as disclosed in Olsson is a way to suppress the out-of-focus edges or boundaries because the defocused borders are corrected and will therefore not be included in the composite image.

Olsson further describes that the "integration of the final image might in this example be relatively simple, as each sharp element is easily identified and the defocused areas are substituted by sharp areas" (Olsson col. 5 lines 21-25). Again, this substitution of defocused edges qualifies as the claimed "suppression", because the defocused elements are being kept out of the final image.

2. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Furthermore, applicant's arguments with respect to the motivation to combine the references is not persuasive. A motivation to combine was given in the previous office action and will be repeated in the below rejection.

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3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 8-17, and 20-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Olsson (USPN 6,445,415).

Regarding claim 1: Olsson discloses determining a first set of pixels of the composite image corresponding to either edges or boundaries, wherein the determination includes performing a first type of analysis of the source images (col. 5 lines 1-4; col. 6 lines 6-9: the reference describes identifying edges and borders in a digital image comprised of pixels). Olsson further discloses determining a second set of pixels of the composite image corresponding to surfaces, wherein the determination includes performing a second type of analysis of the source images (col. 5 lines 13-20; col. 6 lines 15-21: the reference describes identifying surfaces in a digital image comprised of pixels).

Olsson further discloses that one of the above two determinations includes the suppression of either out-of-focus edges or boundaries from inclusion into the composite image (col. 5 lines 21-25 and col. 6 lines 50-54: the reference describes operations for keeping the defocused areas out (i.e. suppressing the defocused areas) of the final image).

Regarding claims 20 and 22: Olsson further discloses an imaging system (the camera at col. 10 lines 12-26), a vision system controller (this is implicit in the computer which performs various controlling functions described at col. 10 lines 37-44), a memory portion (implicit in the storing called for at col. 10 lines 28), and a composite image processor is implemented via the 'computer' and the 'programs' discussed at col. 10 lines 45-53, which includes "integration of focused image elements" (col. 10 lines 51-53). A computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in Olsson is to function. This is discussed at col. 10 lines 27-30, a control program ("software") in Olsson is executable on a "computer". Therefore a recording medium for storing the program is inherently required.

Regarding claims 2 and 3: Olsson discloses that both the edge and surface portions of the image are adequately focused (col. 5 lines 13-20; col. 6 lines 15-21: the reference describes that both the edge and surface regions of the image are focused).

Regarding claim 8: Olsson further discloses that the first type of analysis is based on either gray scale intensities or color image intensities at col. 6 lines 6-9 ("light strength or color").

Regarding claim 9: Olsson further discloses that the first type of analysis comprises a first numerical characterization of the source images at some of the plurality of spatial locations (e.g. the "relative derivative" at col. 6 lines 6-12).

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Olsson further discloses that this first numerical characterization indicates which source image edge pixels correspond to edges or boundaries in the source images (col. 6 lines 6-12: "selection method") and provides a degree of focus for the respective pixels (col. 6 lines 43-44: "defocusing degree").

Olsson further discloses that determining the first set of pixels of the composite image comprises analyzing the results of the first numerical characterization to determine which edge pixels have a satisfactory degree of focus (col. 4 lines 43-46; col. 5 lines 21-25; col. 7 lines 50-52).

Regarding claim 10: Olsson further discloses that the numerical characterization is a gradient derivative analysis (col. 6 lines 6-12: The relative derivative disclosed in Olsson is analogous to a gradient derivative analysis as recited in the claim).

Regarding claim 11: Olsson discloses that a satisfactory degree of focus is a degree of focus that satisfies at least one predetermined numerical criterion (col. 6 lines 51-52: "the focused state is determined by simple optical rules")

Regarding claim 12: Olsson discloses having a respective indicated degree of focus that is both a satisfactory degree of focus and a best degree of focus available among the source images (col. 4 lines 43-46: the reference describes comparing the focus of all the sub-images and selecting the 'focused image element.' This 'focused image element' is the best available among the source images. It is also satisfactory.)

Regarding claim 13: Olsson discloses the claimed 'preliminary determination of a first set of pixels'. This was discussed in claim 12 above. Olsson further discloses refining this preliminary determination by eliminating pixels whose degree of focus is quantitatively poorer than that of its connected neighbors (col. 4 lines 48-50: the reference describes that small deficiencies between border pixels are eliminated and replaced with an average value. Another post-preliminary-determination elimination of quantitatively unfocused pixels is described at col. 6 lines 37-54).

Regarding claims 14-17: These claims add the further limitation that the already-discussed methods (from claims 9-12) are performed on surface pixels rather than edge pixels. Olsson discloses that the surface areas are defined by the image borders (col. 6 lines 6-21). Further, Olsson discloses that the focusing techniques are used on surface pixels as well as edge pixels (col. 7 lines 53-58).

Regarding claim 23: All of the limitations of the claim have been previously addressed in the above arguments with respect to claims 9 and 14.

Regarding claim 24: Olsson discloses that the first set of pixels of the composite image is determined before the second set of pixels of the composite image is determined; and the second set of pixels is determined such that the second set of pixels does not include any of the pixels of the composite image which have been determined to be in the first set of pixels (col. 6 lines 6-21). Since the surfaces disclosed in Olsson are limited by the edges, it follows that this second set does not include any of the pixels from the first set.

Regarding claim 25: Olsson discloses that determining the second set of pixels of the composite image further comprises suppressing image artifacts which correspond to out-of-focus edges or boundaries included in the plurality of source images (col. 6 lines 50-54).

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Olsson further discloses that the at least one characteristic associated with the at least one pixel in the second set of pixels of the composite image that lies at least the prescribed setback distance away from each of the pixel of the first set of pixels of the composite image comprises at least one of a source image, a source image index, and a source image focal plane (col. 9 lines 10-25).

Regarding claim 26: Olsson discloses a composite image processor which is part of a general computerized control system of the vision system (col. 10 lines 8-53).

Regarding claim 27: Olsson discloses a general computerized control system further comprising a control instruction generation system operable to generate at least one of a part program instruction, an inspection program control instruction, and a composite image processor control instruction, the generated instruction usable to operate the composite image processor to construct a desired representation of a composite image (col. 10 lines 8-53).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson as applied to claim 5 above, and further in view of Muir et al. (USPN 6,064,767).

With regard to claim 6, Olsson discloses suppressing out of focus edges and boundaries in the plurality of source images, but fails to expressly disclose doing so using the method described in claim 6. Muir, however, discloses determining a pixel in a second set of pixels which lies a prescribed setback distance from a first set of pixels (Muir col. 5 line 59 – col. 6 line 3). The black pixels disclosed in Muir are a second set of pixels and it follows that the white pixels are a first set. The central black “seed” pixel lies a prescribed distance away from any of the pixels from the first set of pixels (i.e. the white pixels).

Muir further discloses subsequently determining a pixel from the second set of pixels which lies a distance less than the prescribed setback distance away from the at least one pixel in the first set of pixels. Muir teaches growing a region of black pixels around the “seed” pixel until a number of white pixels is encountered (Muir col. 5 line 59 – col. 6 line 3). The grown black pixels now lie a distance less than the prescribed setback distance away from the at least one pixel in the first set of pixels. It would have been obvious to one reasonably skilled in the art at the time of the invention to use Muir’s image segmentation method to perform an edge focusing as taught by Olsson. Such a modification would have allowed for a clearer determination of region boundaries (Muir col. 6 lines 2-3), which would have resulted in a faster artifact (i.e. out of focus edges) suppressing method (Olsson col. 9 lines 16-19).

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With regard to claim 7, it was stated above that the pixel from the second set of pixels which lies a prescribed setback distance from a pixel in the first set of pixels is a seed pixel.

Muir further discloses that the aforesaid subsequently determined pixel is determined based on a grown region including the seed pixel (Muir col. 5 line 65).

Muir further discloses that the pixel from the second set of pixels which lies a prescribed distance from a first set of pixels has a characteristic of being a source image (Muir col. 5 lines 59-60). The image in Muir which is segmented qualifies as a source image as recited in the claim.

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson in view of Bruce (USPN 6,678,064). The arguments as to the relevance of Olsson as applied to claim 1 above are incorporated herein. With regard to claim 21, Olsson discloses a control program which executes the steps of a method, but fails to expressly disclose a carrier wave encoded to transmit this control program. Bruce, however, teach that program code may be transmitted via a carrier wave (Bruce col. 8 lines 3-10). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the Olsson's control program by adding a carrier wave encode to transmit it as taught by Bruce. Such a modification would have allowed for a way of transmitting the control program (Bruce col. 8 line 4).

Allowable Subject Matter

7. Claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

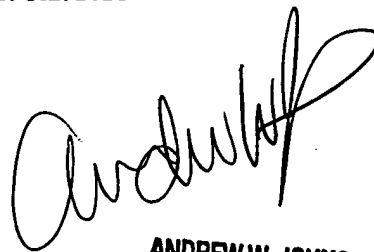
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick L Edwards

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**ANDREW W. JOHNS
PRIMARY EXAMINER**